Multimedia Literature Review Essay, Research Paper

Literature Review

The term media refers to the storage, transmission, interchange, presentation, representation and perception of different information types (data types) such as text, graphics, voice, audio and video.

The term multimedia is used to denote the property of handling a variety of representation media in an integrated manner. The phrase ‘representation media’ is used because it is believed the most fundamental aspect of multimedia systems is the support for different representation types. It is necessary for a multimedia system to support a variety of representation media types. It is also important that the various sources of media types are integrated into a single system framework.

Multimedia is more than multiple media. Multimedia adds interactivity to the combination of text, graphics, images, audio and video. Creating your own media is more interactive than is using existing content, and collaborating with others in the creation of media is still more interactive.

Multimedia systems use a number of different media to communicate supplementary, additional or redundant information. Often this may take the form of using multiple sensory channels, but it may also take the form of different types of visual input – textual, graphical, iconic, animation and video.

Multimedia – the combination of text, animated graphics, video, and sound–presents information in a way that is more interesting and easier to grasp than text alone. It has been used for education at all levels, job training, and games and by the entertainment industry. It is becoming more readily available as the price of personal computers and their accessories declines. Multimedia as a human-computer interface was made possible some half-dozen years ago by the rise of affordable digital technology. Previously, multimedia effects were produced by computer-controlled analogue devices, like videocassette recorders, projectors, and tape recorders. Digital technology’s exponential decline in price and increase in capacity has enabled it to overtake analogue technology. The Internet is the breeding ground for multimedia ideas and the delivery vehicle of multimedia objects to a huge audience.

While we have treated various output media in isolation, it is clear that interesting issues emerge as they are combined in what is termed multimedia. In this sense, any computer application that employs a video disk, images from a CD-ROM, uses high quality sound, or uses high quality video images on screen may be termed a multimedia application. Such interfaces are often aesthetically appealing and, where high capacity storage devices such as CD-ROM are used, can provide effective interactions for the user by acting as very large databases or storehouses of information with dense but easy-to-use cross-referencing and indexing.

Multimedia is all things to all people. The name can convey a highly specific meaning or less then nothing, depending on your audience. In fact, multimedia is a singular mix of disparate technologies with overlapping application in pursuit of a market and an identity. We can describe it as the seamless integration of data, text, images and sound within a single digital information environment.

Multimedia finds its worth in the field of presenting information in a manner that is intuitive and more natural then traditional means.

A multimedia user interface must provide a wide variety of easily understood and usable media control tools. In addition, information views need to be integrated with structural views, since the viewing of information will often alternate moving through the structure by one means or another.

Interactive Multimedia (IMM) is about empowering the user to explore new realms by a variety of pathways. It is an umbrella term for a range of videodisc, compact disc and computer-based systems that allow the creation, integration and manipulation of text, graphics, still and moving video images and sound.

The computer elements of an IMM system have the capacity to:

? Store, manipulate and present a range of information forms

? Allow various forms of computer-based information to be accessed in linear and non-linear ways.

? Provide graphics overlay and print out screen material.

? Enable learners to work independently.

? Provide feedback to the learner

Interactive multimedia provides a powerful means of enhancing learning and information provision. There are however some cautions which need to be heeded if the full potential of IMM is to be realised. These can be seen listed below:

? Lack of world standards

? Technical problems

? Platforms

? Building successful teams

? Developmental costs

Interactivity means that the user receives appropriate and expected feedback in response to actions taken. It is a two-way human-machine communication involving an end-user and a computer-based instructional system. Users actively direct the flow and direction of the instructional or information programmes which, in turn, exchange information with the viewers, processing their inputs in order to generate the appropriate response within the context of the programme.

The basic elements of human interface design are now well established. The user, not the computer should initiate all actions. The user accesses and manipulates the various elements of the product by clicking on buttons, icons or metaphors with a mouse or other pointing device. Interface design should be consistent where appropriate and differentiated where needed so the user can rely on recognition rather than recall. The user should always be given immediate auditory or visual feedback. User activities should be broken into small steps where tasks are complex. The interface design should be aesthetically pleasing, appropriate to the content and suited to the learner’s culture and prior knowledge.

For designers of multimedia the main design issues are how to integrate the media and which media to use for presenting different kinds of information.

The development of metaphorical interfaces, direct manipulation, graphical user interfaces (GUI’s) and recent advances in the field of virtual reality allow users to control the system by manipulating objects such as icons, windows, menus and scroll bars. In well designed Interfaces, these objects are so selected and represented that users can intuitively deduce their meaning and their function in the system from prior ‘everyday knowledge’ and experience.

Hypertext is a system for presenting active text. The key feature from the learner’s point of view is that the text has many nodes and links, which allow them to determine their own routes through the material. Hypertext has many applications, including use as a presentation medium for information management and browsing, providing access to information that the public needs (such as tourism information) and for various activities.

Hypermedia combines aspects of hypertext and a variety of multimedia used in some combination. The branching structure of hypertext is used with multimedia in order to produce a system in which learners can determine their own paths through the medium.

Hypertext is the process of linking concepts within text documents through the use of ‘hotwords’. A hotword is an active word within a document that the user can click on to navigate to another part of the project or to initiate some form of interaction. However navigation by hypertext can be confusing, it can be easy for a user to become ‘lost in hyperspace’. After a few clicks users can be so far from the original topic that they become hopelessly confused.

Nearly all multimedia applications include text in some form. Text and the written language remain the most common way of communicating information in our society. The computer brings extra power to text, not only by allowing you to manipulate its size and shape but also making it an interactive medium.

The ability to show moving images using digital video can greatly enhance IMM projects. Just as video has a role in multimedia, sound also plays an important part in a project. A few carefully placed sounds can greatly enhance a project, but a continuous monologue can be highly distracting.

With the text-to-speech technology, the computer interprets text and converts it into phonetic sounds in much the same way as a human would. Thus, the computer can read back any text within any program with reasonable fidelity. This feature is very useful within an IMM program because large amounts of text can be converted to audio without large sound files. A particular use of this technology is to offer an alternative for vision-impaired people. There are however, some disadvantages to computer generated speech. The speech can sound robotic compared to human speech and it lacks the variable information that can make human speakers appealing.

Unlike print or graphics, animation is a dynamic medium. We get a sense of relative timing, position, direction and speed of action. We need no captions because the message is conveyed by the motion and the scene. Simply put, animation is the process of creating, usually graphically a series of frames and then having them display rapidly to get a sense of movement.

Video provides high-speed information transfer and shows temporal relationships. Video is produced by successive capture and storage of images as they change with time.

Two types of speech are available for use by multimedia developers: digitised and synthesised. Digitised speech provides high quality natural speech while synthesised speech may not sound as natural as human speech. Even with improved techniques for generating speech, it is not incorporated into multimedia programs as often as it could be. This may be due to a lack of understanding of how high quality speech is produced.

Multimedia interface designers have typically used a navigation/map metaphor, a menu/hierarchy metaphor or a journal (sequence) metaphor. An example of the first strategy is the Virtual Museum, produced by Apple Computer. Here the user accesses the multimedia information by navigating through the virtual museum, moving from room to room by selecting directions of movement. Examples of the second strategy include on-line encyclopaedias and electronic books where a table of contents is used to organise the material.

It is helpful to view multimedia applications as a convergence of today’s content and titles, such as movies and books of today’s computer application programs, such as word processors and of today’s network services. As an example a multimedia book should have the following features. Besides text, the book has other media that the author created, including not only text, graphics and images but also audio and video to make the book’s content clearer or more enjoyable. Programs should be built-in to help a user navigate through the author’s media. Multimedia’s driving technologies, mainly digital electronics and fiberoptic communications are making more and more functions sufficiently economical for consumers to use.

Example applications include:

Desktop Video Conferences with collaboration

Multimedia Store-and-Forward mail

Consumer Edutainment, Infotainmnet, Sociotainment

Digital Libraries

Video on demand

Hybrid Applications

IMM has many applications in libraries. IMM can bring knowledge in its entire media formats into condensed, accessible forms capable of being used for reference and educational applications.

On the whole, within the library sector IMM is currently regarded with some ambivalence. Many library professionals look upon it as an interesting technology, but one that will require significant investment and change if its potential is to be fully realised. Possible barriers to the effective adoption of IMM by librarians may be cited as financial constraints and a lack of requisite resources resulting in a lack of opportunity to become familiar with the new and emergent systems; ingrained traditional resistance to change; a degree of uncertainty regarding the appropriateness of the technology to various applications; an inability to grasp the significance of IMM and a lack of experience, knowledge and skills in regard to IMM among library professionals.

Example applications include the Book House – a library system using hypertext techniques to help users find books without the limitations of traditional information retrieval. The user interface of the Book House is based on a building like a real library with the user being able to enter rooms filled with children’s books, adult books etc. The system supports four basic search strategies, using icons and pictures to enable location of the books or topic sought.

Voice response and voice recognition technologies could be used in a library situation, this could mean that merely speaking a unique book identifier or name could trigger the system into automatically filling in the remainder of the bibliographic or personal details relating to that item or person.

Increasingly, multimedia systems will be developed with the aim of allowing non-textual information to be used directly, in a demonstrational manner. Even when text is present other media provide different additional information. Also, when dealing with multimedia, users are naturally disposed to interact in ways other than those developed for text. A first step to giving the user the impression that he/she is dealing directly with non-textual material allows database search on the basis of identifying images that best suit the user’s purposes. An initial query that turns up a large number of images can be refined by allowing the user to point a few images out of the set that contain items of interest. The system can then use the text descriptions attached to the chosen images to form a new query and offer a further set of possibly more relevant images. My conclusion is that design could benefit tremendously from open and collaborative multimedia research – not from relatively closed multimedia packages.